

Developing Reproductive Protection Programs in Industrial and Academic Settings

Introduction

Reproductive Hazard Protection Programs (or Reproductive Protection Programs, RPPs) are designed to protect workers handling substances that may impact their reproductive health. These substances may be chemical, biological, radiological or physical in nature, and may include both known (or suspected) reproductive and developmental hazards. Workers may include both employees or students, as there are many academic programs that involve handling these same substances. The programs include but are not limited to chemistry, chemical engineering, biological sciences, agricultural sciences, medical and pharmaceutical sciences.

The goals of any RPP are to *identify* reproductive and developmental hazards to which employees (students) may be exposed, then *inform* employees of the exposure and *implement* exposure mitigation and corporate or university policy.

Terminology common in RPPs

Reproductive Hazard: An agent that interferes with or prevents conception¹. These agents may be chemical, physical or biological in nature².

Developmental Hazard: An agent that produces structural abnormalities, functional defects, alterations in growth or death¹.

Mutagen: An agent that causes a genetic mutation.

Teratogen: An agent that causes malformation of an embryo.

Background on RPPs

Reproductive protection programs were historically called “fetal protection programs” when employers were concerned with women’s exposure to chemicals known to be developmental hazards. That was the case – until the landmark US Supreme Court decision in the Johnson Control case (*Auto Workers v. Johnson Controls Inc.*; 499 US 197, 1991) which held that gender-specific fetal protection policies were discriminatory³. Furthermore, the court held that employers cannot make occupational exposure decisions for the unborn children: Decisions regarding unborn children are left to the parents. Since the 1991 US Supreme Court decision, reproductive protection plans are now gender neutral and incorporate both male and female reproductive and developmental hazards.

There are no specific Occupational Safety and Health Administration (US-DOL/OSHA) standards governing exposure to reproductive health hazards in the workplace^a. Implementing a RPP, if needed, may be important under OSHA’s General Duty Clause. The United States

^a Agent-specific standards for 1,2-dibromo-3-chloropropane (29 CFR 1910.1044) and ethylene oxide (29 CFR 1919.1047) were originally based on carcinogenicity; lead (29 CFR 1910.1025) was based on the prevention of neuropathy (plumbism).

Nuclear Regulatory Commission (NRC) regulates radiation dose to embryos and fetuses for radiation workers who declare pregnancy to their employers^{4,5}.

Even though generally accepted exposure control practices or adherence to recognized occupational control limits may be adequate for the average worker or student, these regulatory or recommended occupational exposure limits may not be sufficient to provide protection to a developing fetus. It is possible that short-term, low-exposure situations during critical fetal development periods may produce long-term health effects.

Developing a Reproductive Protection Program

Identify reproductive and developmental hazards

The information that is used to identify reproductive and developmental hazards should be reliable and peer-reviewed. Stay away from anecdotal or media-generated reference materials when developing your facility's RPP. There are a number of excellent sources that are available:

- California's Proposition 65 List: This list is updated regularly and is administered by California Environmental Protection Agency's Office of Environmental Health Hazards Assessment. The list contains information on both carcinogens and substances known to cause birth defects. It is free and available on the Internet⁶.
- *Patty's Toxicology* (ISBN 9780471125471). This is currently available from John Wiley and Sons. Access is subscription based.
- *Sittig's Handbook of Toxic and Hazardous Chemicals* (ISBN 9781437778694). Sittig's is available via subscription to Elsevier's Hazmat Navigator.
- *Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Edition*. *Prudent Practices* is available both as a stand-alone reference (order from the National Research Council) or available also online for free⁷.

Inform Employees or Students of Exposure

The OSHA Hazard Communication Standard (29 CFR 1910.1200) or the Laboratory Standard (29 CFR 1910.1450) requires employers to inform employees of the health hazards associated with the chemicals with which they work. Complete information includes reproductive and developmental toxicity and any monitoring data that may be available.

It is important that employees or students use this information to make informed decisions regarding their exposure to reproductive and developmental toxins. The concept of informed decision can pose interesting challenges to students who are not covered by OSHA regulations and are enrolled in courses where chemicals are used in a variety of educational activities. Examples include common activities such as: qualitative analyses of unknown samples and mixtures, preservation of laboratory specimens and chemical research.

Information should be made available to the physicians of affected individuals so that together they can make an appropriate decision regarding exposure. In order to maintain the integrity of some laboratory activities, some universities have opted to provide a comprehensive list of compounds used in the course to student's physicians so that informed decisions regarding activity can be made.

Implement Exposure Mitigation and Corporate/University Policy

The common exposure control hierarchy is applicable here:

- Eliminate the use of suspect chemical(s) or substitute chemical with one(s) of a lesser toxicity whenever possible
- Employ engineering controls to reduce exposure
- Address, through policy, administrative controls to reduce exposure
- Ensure proper personal protective equipment (PPE) is available and properly used when working with hazardous chemicals.

It is recognized that in a given chemical process or educational activity, elimination and substitution may not be possible. When those options for reducing exposure are not available, robust engineering controls in conjunction with administrative controls should be established and tested. The use of any personal protective equipment requires a complete written evaluation of the process and exposure risks associated with the process.

Employers and educators are not *required* to offer equivalent tasks or remove from exposure situations those employees or students concerned with their reproductive health, except as provided by Reference 5. They are, however, required to keep exposures less than or equal to the Permissible Exposure Limit for chemicals found in 29 CFR 1910.1000. Employers and educators may *choose* to provide equivalent tasks; however, in doing so, they must remain compliant with the Johnson Controls decision and ensure there is no discrimination shown to those employees or students requesting alternative assignments.

To be effective, any Reproductive Protection Program should be in writing and should provide, at a minimum, the following sections:

- Introduction: A brief statement regarding the purpose of the policy
- Definitions, objectives of the program and guidelines
- Sources of information
- Responsibilities of the employee/student, supervisor/faculty member (or teaching staff) and employer/academic management under the RPP
- A statement of how an employee may implement the RPP
- A statement concerning confidentiality
- A statement of a policy of non-discrimination
- A statement regarding how exposure concerns will be evaluated
- A statement of the information that will be given to employees and their physicians in order to make informed decisions.

References

1. Jennison, Elizabeth Ann. In *Handbook of Chemical Health and Safety*; Alaimo, Robert J. Ed; Oxford University Press: New York. 2001; 130.
2. *Reproductive Hazards*. US-DOL/OSHA Information page: <http://osha.gov/SLTC/reproductivehazards/index.html>, accessed 13 July 2012.
3. *Auto Workers v. Johnson Controls, Inc.* 49 US 197, 1991.
4. 10 CFR 20.1208. *Dose equivalent to an embryo/fetus.*
5. US Nuclear Regulatory Commission Regulatory Guide 8.13 (NUREG 8.13), Revision 3, 1999.
6. *Chemicals known to the state [of California] to cause cancer or reproductive toxicity.* http://oehha.ca.gov/prop65/prop65_list/newlist.html, accessed 13 July 2012.
7. *Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Edition.* National Academy Press 2010. http://www.nap.edu/openbook.php?record_id=12654&page=1, accessed 13 July 2012.